Sandbag Barrier

Standard Symbol

BMP Objectives

- ○ Soil Stabilization
- ● Sediment Control
- ○ Tracking Control
- ○ Wind Erosion Control
- ○ Non-Storm Water Management
- ○ Materials and Waste Management

Definition and Purpose

A sandbag barrier is a temporary linear sediment barrier consisting of stacked sandbags, designed to intercept and slow the flow of sediment-laden sheet flow runoff. Sandbag barriers allow sediment to settle from runoff before water leaves the construction site.

Appropriate Applications

■ This BMP may be implemented on a project-by-project basis in addition to other BMPs when determined necessary and feasible by the Resident Engineer (RE).

■ Along the perimeter of a site.

■ Along streams and channels.

■ Below the toe of exposed and erodible slopes.

■ Down slope of exposed soil areas.

■ Around stockpiles.

■ Across channels to serve as a barrier for utility trenches or provide a temporary channel crossing for construction equipment, to reduce stream impacts.

■ Parallel to a roadway to keep sediment off paved areas.

■ At the top of slopes to divert roadway runoff away from disturbed slopes.

■ To divert or direct flow or create a temporary sediment/desilting basin.

■ During construction activities in stream beds when the contributing drainage area is less than 2 ha (5 ac).

Caltrans Storm Water Quality Handbooks
Construction Site Best Management Practices Manual
March 1, 2003

Section 4
Sandbag Barrier **SC-8**
1 of 6

Sandbag Barrier

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■ During construction activities in stream beds when the contributing drainage area is less than 2 ha (5 ac).

■ When extended construction period limits the use of either silt fences or straw bale barriers.

■ Along the perimeter of vehicle and equipment fueling and maintenance areas or chemical storage areas.

■ To capture and detain non-storm water flows until proper cleaning operations occur.

■ When site conditions or construction sequencing require adjustments or relocation of the barrier to meet changing field conditions and needs during construction.

■ To temporarily close or continue broken, damaged or incomplete curbs.

Limitations

■ Limit the drainage area upstream of the barrier to 2 ha (5 ac).

■ Degraded sandbags may rupture when removed, spilling sand.

■ Installation can be labor intensive.

■ Limited durability for long-term projects.

Caltrans Storm Water Quality Handbooks
Construction Site Best Management Practices Manual
March 1, 2003

Section 4
Sandbag Barrier **SC-8**
2 of 6

■   When used to detain concentrated flows, maintenance requirements increase.

Standards and Specifications

Materials

■   Sandbag Material: Sandbag shall be woven polypropylene, polyethylene or polyamide fabric, minimum unit weight 135 g/m2 (four ounces per square yard), mullen burst strength exceeding 2,070 kPa (300 psi) in conformance with the requirements in ASTM designation D3786, and ultraviolet stability exceeding 70% in conformance with the requirements in ASTM designation D4355. Use of burlap is not acceptable.

■   Sandbag Size: Each sand-filled bag shall have a length of 450 mm (18 in), width of 300 mm (12 in), thickness of 75 mm (3 in), and mass of approximately 15 kg (33 lb.). Bag dimensions are nominal, and may vary based on locally available materials. Alternative bag sizes shall be submitted to the RE for approval prior to deployment.

■   Fill Material: All sandbag fill material shall be non-cohesive, Class 1 or Class 2 permeable material free from clay and deleterious material, conforming to the provisions in Standard Specifications Section 68-1.025 "Permeable Material". The requirements for the Durability Index and Sand Equivalent do not apply. Fill material is subject to approval by the RE.

Installation

■   When used as a linear sediment control:

   –   Install along a level contour.

   –   Turn ends of sandbag row up slope to prevent flow around the ends.

   –   Generally, sandbag barriers shall be used in conjunction with temporary soil stabilization controls up slope to provide effective erosion and sediment control.

   –   Install as shown in Pages 4 and 5 of this BMP.

■   Construct sandbag barriers with a set-back of at least 1m (3 ft) from the toe of a slope. Where it is determined to be not practical due to specific site conditions, the sandbag barrier may be constructed at the toe of the slope, but shall be constructed as far from the toe of the slope as practicable.
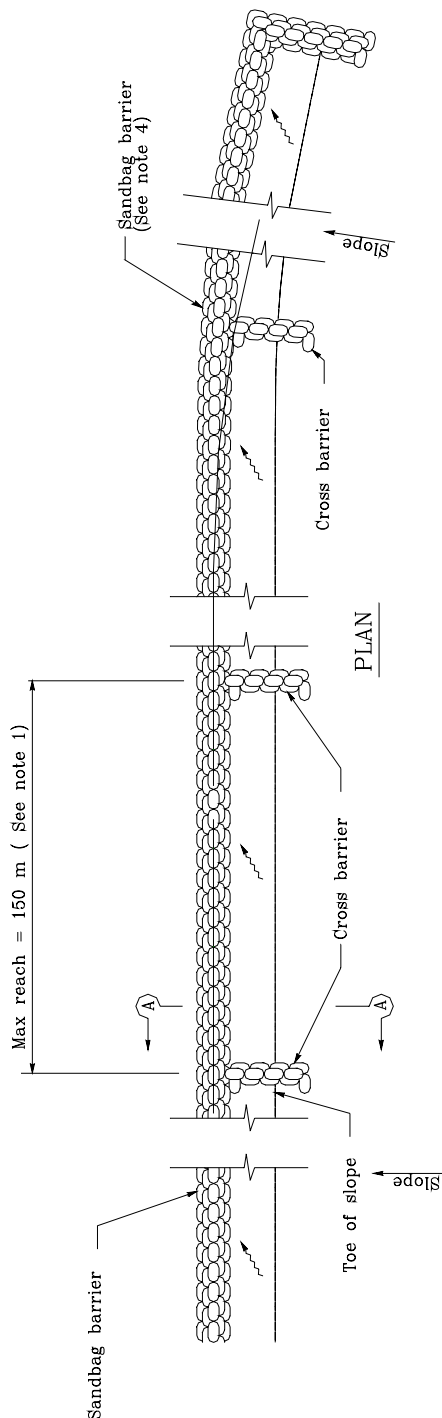
Maintenance and Inspection

■   Inspect sandbag barriers before and after each rainfall event, and weekly throughout the rainy season.

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Construction Site Best Management Practices Manual
March 1, 2003

Section 4
Sandbag Barrier **SC-8**
3 of 6

■ Reshape or replace sandbags as needed, or as directed by the RE.

■ Repair washouts or other damages as needed, or as directed by the RE.

■ Inspect sandbag barriers for sediment accumulations and remove sediments when accumulation reaches one-third the barrier height. Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the highway right-of-way in conformance with the Standard Specifications.

■ Remove sandbags when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilized the area.

Caltrans Storm Water Quality Handbooks
Construction Site Best Management Practices Manual
March 1, 2003

Section 4
Sandbag Barrier **SC-8**
4 of 6

Sandbag barrier

Toe of slope

Slope

A

A

Cross barrier

Max reach = 150 m (See note 1)

PLAN

Sandbag barrier
(See note 4)

Slope

Cross barrier

TEMPORARY LINEAR SEDIMENT BARRIER (TYPE SANDBAG)

Caltrans **M**etric

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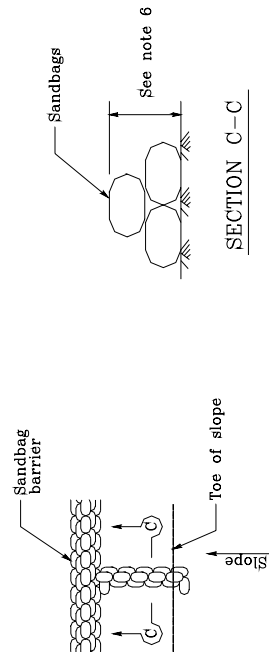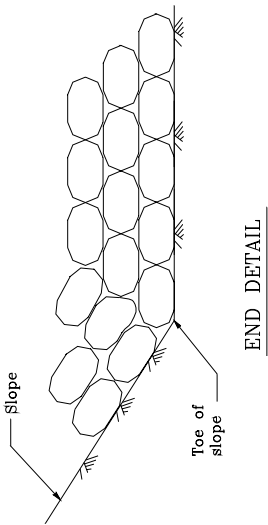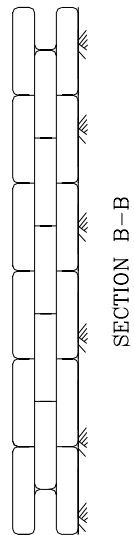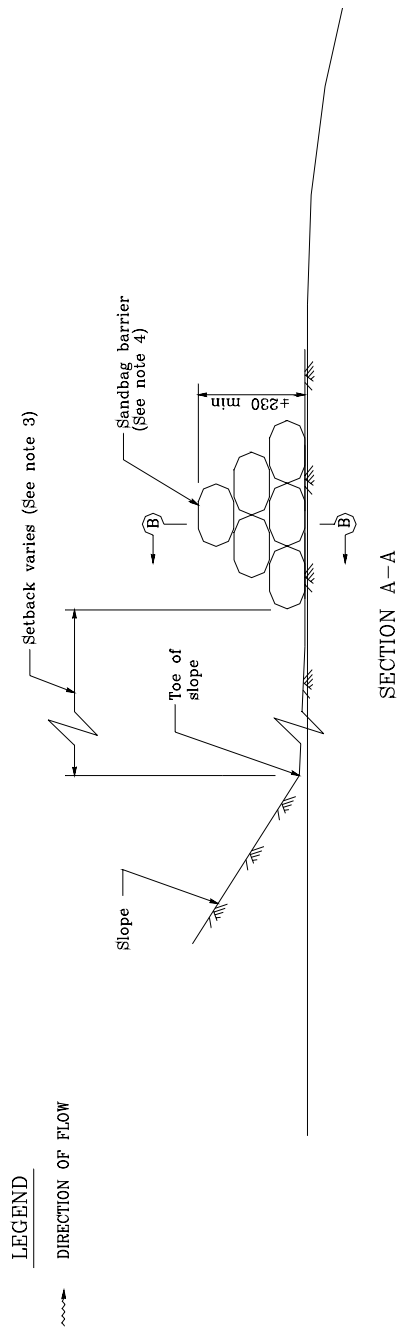
TEMPORARY LINEAR SEDIMENT BARRIER
(TYPE SANDBAG)

NO SCALE

ALL DIMENSIONS ARE IN
MILLIMETERS UNLESS OTHERWISE SHOWN

NOTES

1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/2 the height of the linear barrier. In no case shall the reach length exceed 150 m.

2. Place sandbags tightly.

3. Dimension may vary to fit field condition.

4. Sandbag barrier shall be a minimum of 3 bags high.

5. The end of the barrier shall be turned up slope.

6. Cross barriers shall be a min of 1/2 and a max of 2/3 the height of the linear barrier.

7. Sandbag rows and layers shall be staggered to eliminate gaps.

Caltrans Storm Water Quality Handbooks
Construction Site Best Management Practices Manual
March 1, 2003

Section 4
Sandbag Barrier **SC-8**
5 of 6

SECTION A-A

- Setback varies (See note 3)
- Sandbag barrier (See note 4)
- ±230 min.
- Toe of slope
- Slope

END DETAIL

- Slope
- Toe of slope

SECTION B-B

SECTION C-C

- Sandbags
- See note 6

CROSS BARRIER DETAIL

- Sandbag barrier
- Toe of slope
- Slope

LEGEND

→ DIRECTION OF FLOW

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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(TYPE SANDBAG)

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Caltrans Storm Water Quality Handbooks
Construction Site Best Management Practices Manual
March 1, 2003

Section 4
Sandbag Barrier **SC-8**
6 of 6